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MEASURING SHADOW BANKING IN THE DUTCH NATIONAL ACCOUNTS

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MEASURING SHADOW BANKING IN THE DUTCH NATIONAL ACCOUNTS

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Abstract

Recently, there has been growing attention for the shadow banking phenomenon. Capital requirements for regulated real banks have made it more attractive to provide credit via unregulated shadow banks. Complicated financial products like securities, swaps and other derivatives are part of their business. Risks may increase in the less traditional areas of the banking system, like hedge funds, financial vehicle corporations, and other financial intermediaries (OFI). The shadow banking sector is a systemic risk because of the interconnectedness of shadow banks with the regulated part of the financial system.

‘Addressing those risks is challenging. Firstly, because shadow banking is an elusive concept that is hard to quantify with available statistics. Secondly, as I have argued, the tools needed to prevent the building-up of excessive risks in that sector are currently not in the set of instruments available to the ECB or to macro-prudential authorities at large – and some need yet to be devised.’ said ECB vice-president Constâncio in his speech on 13 February 2015.

This paper adopts the challenge to quantify the size and risk of the shadow banking sector in the Netherlands. That is a prerequisite for developing tools to prevent excessive risks in that sector. Firstly, we will make an inventory of the definitions used in literature to describe the delineation of shadow banking, and also try to select the best definition(s) applicable to the Netherlands. Secondly, we will investigate how to measure the size and risks of shadow banking. Possible sources of data are the Dutch National Accounts, more specifically the Sector Accounts. They contain the balance sheets of financial sectors, relevant for leverage and other statistical measures of risk, and give insight to the interconnected nature of banking and non-banking sectors.

The sources, quality of the data and their applicability to the Netherlands will be paid attention to. Finally, we will perform analyses based on the collected definitions and available data. This analysis aims to contribute to improved supervision of shadow banking.

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1. Introduction

Recently, there has been growing attention for the shadow banking phenomenon. The reason for this has much to do with unconventional monetary policy. During the financial crisis central banks have given shadow banks a lifeline granting them access to official liquidity facilities and public credit guarantees, since private sector guarantees to support the shadow banking system failed. The run on Bear Stearns in March 2008 prompted the Federal Reserve to create special facilities to provide loans of cash and securities to primary dealers (which have a trading relationship with the Federal Reserve Bank of New York). After Lehman Brothers filed for bankruptcy on 15 September 2008 the facilities were expanded by broadening the types of collateral acceptable for these loans. The collapse of the large investment bank provoked a global financial crisis that required emergency lending programs to shadow banks.

The Term Securities Lending Facility (TSLF) was a weekly loan facility to primary dealers that offered Treasury securities held by the System Open Market Account (SOMA) for loan over a one-month term in exchange for other program-eligible general collateral (student loans, car loans, credit card debt). The Primary Dealer Credit Facility (PDCF) was an overnight loan facility that provided funding to primary dealers secured by collateral with appropriate haircuts (the value of collateral exceeds the value of the loan). In an effort to drive down private borrowing rates, the Federal Reserve purchased substantial quantities of assets with medium and long maturities. In November 2008, the Federal Open Market Committee (FOMC) announced a large-scale asset purchase (LSAP) of direct obligations from housing-related GSEs and agency mortgage-backed securities (MBS). In March 2009, the program was expanded to the purchase of longer-term Treasury securities. These are just a few examples of the interventions in the shadow banking system implemented in response to the financial crisis.

What is shadow banking? According to ECB vice-president Constâncio in his speech on 13 February 2015 “an elusive concept that is hard to quantify with available statistics”. The financial crisis has taught that risks may increase in the less traditional areas of the banking system, like hedge funds, financial vehicle corporations, and other financial intermediaries (OFI). Shadow banks normally lack access to central bank liquidity or public sector credit guarantees. But exceptional times call for exceptional measures, since the shadow banking system is a systemic risk, because of the interconnectedness with the regulated part of the financial system.

The first part of this paper is a literature study of the shadow banking phenomenon. Firstly, an inventory is made of the definitions used in literature to delineate shadow banking (paragraph 2). The benefits and risks of shadow banking are described in paragraph 3. Shadow banking is explained using the comprehensive scheme of Zoltan Poszar (2008), which gives an overview of shadow bank entities and credit intermediation activities (paragraph 4).

The second part of the paper is an effort to quantify the size and risk of the Dutch shadow banking system, since shadow banks are predominant in the Netherlands (paragraph 5). Sources of data are the Dutch National Accounts, more specifically the Sector Accounts. They contain the balance sheets of financial sectors, relevant for leverage, and give insight to the interconnected nature of banking and non-banking sectors. Finally, paragraph 6 concludes.

2. Definition of shadow banking

Shadow banking has been an evolving concept since its introduction in 2007, by Paul McCully (2007). He broadly referred to shadow banks as “the whole alphabet soup of levered up non-bank investment conduits, vehicles, and structures”. The focus on leverage has been expanded to concrete activities and level of regulation by Acharya and Öncü (2010) who define shadow banks as “financial institutions that mostly look like a bank, borrow short term in rollover debt markets, leverage themselves
significantly, and lend and invest in longer-term and illiquid assets. Unlike banks, however, the shadow banking system is much less regulated”. The definition of Pozsar et al. (2010) adds that credit intermediation by shadow banks is not ‘enhanced’ by access to central bank liquidity or deposit insurance: “Shadow banks are financial intermediaries that conduct maturity, credit, and liquidity transformation without explicit access to central bank liquidity or public sector credit guarantees”. Shadow banks typically include money market funds, hedge funds, broker/dealers, special purpose vehicles, finance companies, leasing companies, and trust companies. Insurance and reinsurance undertakings which issue or guarantee credit products are also listed as possible shadow banking entities (European Commission 2012). Shadow banks look like regulated banks but they differ in funding techniques. Without access to central bank liquidity nor insured deposits, shadow banks can promise liquidity on demand by issuing collateralized financial credit (repos). This is a short term and cheap funding source (Perotti 2012). Securitised financial transactions grant the benefit of a ‘safe harbour status’. Lenders of collateralised financial credit are provided bankruptcy privileges; they can immediately repossess and resell pledged collateral. Bankruptcy legislation expanded the collateral with safe harbour status, which has contributed to a shadow banking boost in the US and EU (Perotti 2010). It is this safe harbour status that makes shadow banks credible. Shadow banking activities are characterised by securities financing transactions; securitisation, securities lending, repos, loans and collecting deposits. Most important component of shadow banking is securitized debt, which is debt secured by underlying assets. These collateral assets can be debt securities themselves. Examples of underlying assets are U.S. Treasuries, agencies, corporate bonds, commercial paper, mortgage-backed securities (MBS) and equities. Collateral backing securities may be re-hypothecated or reused. Re-hypothecation: a party who receives a pledge of collateral against a transaction pledges the same collateral to a third party. Re-use: the buyer of a repo transaction becomes the owner of the collateral and may even sell the collateral.

The Financial Stability Board (FSB) broadly describes the shadow banking system as “credit intermediation that involves entities and activities outside the regular banking system” (FSB 2011a). The limitation to credit intermediation excludes pure equity trading and foreign currency transactions unrelated to credit intermediation. The core business of shadow banks also includes trading of credit-related financial instruments (bonds, structured/hybrid financial products) and other activities that constitute the credit intermediation chain (derivatives). Ghosh et al. (2012) point out that, whereas traditional banking intermediation between savers and borrowers occurs in a single entity (under one roof), shadow banking can be described as a long chain of credit intermediation: “Shadow banking comprises a set of activities, markets, contracts, and institutions that operate partially (or fully) outside the traditional commercial banking sector, and, as such, are either lightly regulated or not regulated at all. The distinguishing feature of shadow banking is that it decomposes the process of credit intermediation into a sequence of discrete operations. A shadow banking system can be composed of a single entity that intermediates between end-suppliers and end-borrowers of funds, or it could involve multiple entities forming a chain”. This definition also includes activities and entities that operate partially outside the regular banking sector, while the FSB defines shadow credit intermediation to be fully outside the regular banking system. In practice many shadow banks operate within regular banks. Shadow liabilities inside the safety net makes it difficult to make a distinction between traditional and shadow credit intermediation. That’s why Pozsar et al. (2010) propose to classify by instrument and not by institutional level. Claessens and Ratnovski (2014) agree on this point and advocate a more functional delineation of intermediation services. In their view reliance on backstops is what distinguishes shadow banks from other financial intermediaries using capital markets’ type tools, such as custodians, hedge funds and leasing companies. Shadow banking includes “all financial activities, except traditional banking, which rely on a private or public backstop to operate”. They need a backstop to absorb the rare and systemic risks (for example systemic liquidity risk, bankruptcy risk) that cannot be distributed away via typical activities like securitisation and the use of collateral. A backstop can be obtained privately by operating within banks or publicly by government guarantees such as bankruptcy stay exemptions for repos, or more generally ‘too-big-to-fail’ guarantees. Hancock and Passmore (2015) make a distinction between relationship-lending and actuarially-based lending. A traditional bank provides
a loan and bundles financing with management assistance. Building and maintaining relationships with customers has substantial fixed costs. Shadow banks do not invest in relationships; they only evaluate the value of collateral. This distinction between traditional banks and shadow banks show that shadow banks can be more competitive, taking over loans of customers that don’t need a relationship with the loan originator anymore.

3. Benefits and Risks

Shadow banking has a negative association. Seeking the shadows in the sense of circumvention of regulation is not the only motivation for shadow banking. The benefits are crystal clear, although the recent financial crisis has particularly reminded us of the risks.

3.1. Benefits

Shadow banking has some benefits.

(i) Alternative investment

Cash-rich institutional investors have an alternative to traditional bank deposits, which are insured only to a certain amount. Short-term government guaranteed securities are money-like instruments; investors value the liquidity and extreme safety of U.S. Treasuries (Krishnamurthy and Vissing-Jorgensen 2012), but their supply is insufficient. There is too much demand for safe, short-term and liquid instruments. So, investors seek new forms of ‘private money’: safe liquid assets, protected by over-collateralisation, mark-to-market accounting and variation margin (Turner 2012). Private financial intermediaries compete with the government in the provision of money-like claims; the supply of total financial sector short-term debt falls when there are more government securities outstanding (Greenwood, Hanson and Stein 2012; Krishnamurthy and Vissing-Jorgensen 2013). Further, investors can get higher returns to their savings. The rise in shadow banking is thus driven by increased demand for insured deposit alternatives (Poszar 2011).

(ii) Alternative credit

On the supply side borrowers can obtain alternative funding, in response to tight controls over regulated bank lending. Specialized expertise enables a more efficient channelling of funds through the credit intermediation chain towards the real economy, particularly small and medium-sized enterprises (SMEs). The Economist (February 25th 2012) quoted a senior American regulator: ‘Securitisation is a good thing. If everything was on banks’ balance sheets there wouldn’t be enough credit’. Shadow banking has developed into an important source of nonbank finance.

(iii) Risk diversification

A well-functioning financial system provides risk diversification. Pooling and tranching cash flows from loans creates safe assets for investors. It overcomes adverse selection problems; trading losses associated with information asymmetries can be mitigated by securities designed to split the cash flows of underlying assets (Gorton and Pennacchi 1990). One should be aware that risk transfer, risk diversification are considerable benefits from securitisation.

(iv) Efficient financial markets

Securities financing transactions are useful to investors managing their liquidity, maturity, and credit risk (specialization). Shadow credit intermediation can improve the efficient functioning of financial markets through economies of scale in the origination, structuring, trading and funding of loans (Poszar et
Further, credit supply and demand are matched more efficiently due to increased specialization (European Commission 2012).

3.2. Risks

The recent financial crisis has taught us that there is a shadow side. Credit risk transfers, maturity and liquidity transformation, and leverage are important sources of risk. In times of economic stress the shadow banking system itself can become a systemic risk, directly and through interconnectedness with the regular banking system.

(i) Credit risk

Credit risk is the most fundamental risk in credit intermediation, for both traditional banks and shadow banks. It is in essence the risk that the lender won’t get his money back. Government bonds normally carry low credit risk, since most governments won’t file for bankruptcy. Corporate bonds carry higher credit risk and thus have more interest payments. Rating agencies (Moody’s, Standard & Poor’s, Fitch, DRBS and others) range the credit risk of securities from most secure (AAA) to junk status (BBB to D).

(ii) Maturity and liquidity risk

Shadow banks usually fund themselves with short-term asset-backed commercial paper (ABCP), repos (see paragraph 4.4.2) and money market funds and invest in longer-term and illiquid assets. These callable deposit-like liabilities are not guaranteed by deposit insurance, neither protected by access to the central bank as a lender of last resort. Liquidity is a measure of supply and demand for a security. If an investor is unable to liquidate his security, he may default meeting his debt obligations, increasing his credit risk. Maturity is the date on which the borrowed money is paid back. Maturity risk is the risk that the issuer of securities will default before the maturity date. This risk is higher when maturity is long-term. Consequently, liquidity and maturity transformation make the banking system vulnerable to sudden large-scale withdrawals of funds. A bank run on shadow banks may be provoked by increasing repo haircuts (the value of collateral is higher than the value of the loan) or by creditors who refuse to extend repo financing. With the house price bubble burst in 2007, some of the subprime mortgage originators got into trouble. Repo depositors did not have information which loans would default. The greatest risk is fear and uncertainty. In case of a bankruptcy the repo collateral can immediately be sold in the market, without being subject to an automatic stay provision of the bankruptcy code. But it was questionable if the collateral - valued at market prices - could be fully recovered. In a repo agreement a haircut is applied; the value of the collateral is higher than the cash borrowed. Repo haircuts increased for both subprime related and non-subprime related asset-backed securities (Gorton and Metrick 2010). This is because of a loss of confidence in all securitized assets. Above all, repo depositors (and borrowers) feared the systemic risk of a repo market collapse, where liquidity dries up. A liquidity crisis will make shadow banks dependent on credit of regulated banks or force them to sell assets with loss. A regular bank also faces the risk of a bank run on short-term deposits. However, the investors in short-term and liquid non-deposits of shadow banks are exposed to higher risks, because the shadow banking system is lacking access to public liquidity and insurance, and is going without the prudential standards and supervision of the regulated banking system.

(iii) Leverage

Financial leverage describes the use of borrowed money to magnify profit potential, which can be measured by the debt-to-equity ratio. Leverage is defined as the ratio of total assets to equity. Securities financing transactions - repos and securities lending (par. 4.4.2) - can increase leverage. The collateral underlying these transactions can be ‘re-hypothecated’ to raise funds, which can be used to buy assets, that
serve as collateral to raise more funds, etcetera. This may result in excessive leverage, which increases the exposure to risk, because of potential liquidity problems; the return on investments should always (during booms and busts) be high enough to cover interest and principal payments. Valuation changes in collateral assets can cause procyclicality, reinforcing interactions between the financial and real economy. Rising collateral asset prices promote collateralised lending. Decreasing values of collateral and increasing margins/haircuts potentially lead to deleveraging and asset fire sales. Adrian and Shin (2010) have documented evidence that marked-to-market leverage is strongly procyclical; high during economic booms and low during busts. Asset price changes appear immediately on marked-to-market balance sheets and changes the net worth of – highly leveraged – financial intermediaries, who react by actively adjusting the size of their balance sheets. Rising prices of assets may lead to stronger balance sheets and encourage an active response to adjust the leverage by buying assets; a greater demand to buy assets puts further upward pressure on their prices, which in turn leads to stronger balance sheets and encourages active balance sheet management, etcetera. Procyclical leverage also works the other way round. Asset price decreases may lead to weaker balance sheets, a response of adjusting leverage by selling assets, which puts downward pressure on the price of these assets, leading to even weaker balance sheets, requiring further deleveraging and potentially asset fire sales, etcetera.

(iv) Interconnectedness and systemic risk

The financial system is characterised by high interconnectedness. The regulated banking system is closely linked to the shadow banking system via securitisation or investments in financial products of shadow banks. Regular banks can provide credit to shadow banks and be funded by them. Failures in shadow banking activities can lead to contagion and spill-over effects, especially in times of economy/financial-wide stress. Systemic risk is defined as “the disruption to the flow of financial services that is caused by an impairment of all or parts of the financial system and has the potential to have serious negative consequences for the real economy” (IMF et al. 2009). Financial services that increase in costs or become temporarily unavailable are negative externalities to the financial system, but will have significant spill-over effects to the real economy. The liquidity risk that secured repo financing may become unavailable is a systemic risk, especially when assets held by the financial sector become more illiquid. The shadow banking system itself potentially is a systemic risk. Risks can be transmitted to regular banks directly through borrowing from banks, or indirectly via price decreases of assets and derivatives held by both regular and shadow banks. A fall in asset prices weakens the balance sheet of financial institutions and may reduce the amount of credit provided to the real economy. This interconnectedness causes consumers, non-financial corporations and banks to become exposed to asset bubbles and other systemic risks of the shadow banking system.

Summarizing, shadow banking answers the demand for safe, short-term, liquid investments, and provides alternative credit channels. Innovative products improve the functioning of financial markets, for example via risk diversification. Shadow banks have a competitive advantage over regulated banks by avoiding regulation and supervision to regular banks. Tighter regulations and restrictions imposed on traditional banking has encouraged growth in shadow banking, which has no incentive to internalise the costs of risk Ghosh and others (2012). Before the recent financial crisis, banks evaded regulatory capital requirements by repackaging mortgages into mortgage-backed securities. Securitized mortgages were placed in off-balance-sheet conduits, so banks did not have to hold significant capital buffers against them. The holding of AAA-rated mortgage-backed securities on their balance sheet allowed banks to reduce the amount of capital, enabling them to provide more loans (Acharya and Richardson 2009). Although the risks are transferred to the balance sheet of Special Purpose Vehicles (SPVs), banks maintain a connection to the risks of SPVs. The financial markets are characterised by high interconnectedness between the regular and shadow banking system. Regulatory arbitrage might undermine bank regulation and lead to excessive leverage and additional (systemic) risks in the financial system, leaving the goal of monetary and financial stability further away.
4. Poszar map

Zoltan Poszar (2008) provides a map of the shadow banking system. He guides the reader through a landscape of institutions, instruments and vehicles that make up the shadow banking system, and shows the rivers of asset and funding flows between them. Appendix 1 is a simplified reproduction of this exhaustive catalogue. The shadow credit intermediation process consists of seven steps, performed by a specific type of shadow bank and through a specific funding technique (Poszar et al. 2010):

- Step 1: loan origination
- Step 2: loan warehousing
- Step 3: ABS issuance (securitisation)
- Step 4: ABS warehousing
- Step 5: pooling and structuring of ABS into CDOs (re-securitisation)
- Step 6: ABS intermediation
- Step 7: funding

It always starts with a loan, originated for example by finance companies which are funded by commercial paper (CP), medium-term notes (MTN) and bonds. The next step in the intermediation process is loan warehousing by single- and multi-seller conduits that are funded by asset-backed commercial paper (ABCP). Characteristic for shadow banking is securitisation, which is the pooling and structuring of loans into term asset-backed securities (ABS), structured by broker dealers and issued by SPVs. This is followed by ABS warehousing, facilitated through broker dealers’ trading books and funded by repos and ABCP. The chain can continue with re-securitisation, which is the pooling and structuring of ABS into collateralised debt obligations (CDOs), structured by broker dealers and issued by SPVs. Further, ABS intermediation is performed by limited purpose finance companies (LPFCs), structured investment vehicles (SIVs), securities arbitrage conduits and credit hedge funds, which fund themselves by repos, ABCP, MTNs, bonds and capital notes. Last step in the shadow credit intermediation chain is wholesale funding by cash rich investors like Money Market Funds (MMFs) and securities lenders (both buying short-term repos, CP and ABCP) and also fixed income mutual funds, pension funds and insurance companies (buying long-term MTNs and bonds). The next sections describe some of the shadow credit intermediation steps (securitisation, re-securitisation, ABS intermediation, funding) in more detail.

4.1. Securitisation (step 3)

Securitisation is the process by which credits (loans) are originated and bundled together into a pool, which is held as the collateral for securities that are issued and sold to investors. Securitisation transforms pools of loans into tradable debt securities with different risk profiles from the underlying collateral. The originator of the loans sells these assets to the issuer, typically a special purpose vehicle (SPV). The SPV issues asset-backed securities (ABS) and sells them to investors. The cash received from the sale of ABS is used to purchase the loans from the originator. The servicer (part of the same group entity of the originator or a third party) facilitates that the received cash flows from the collateral pool (interest and principal) are paid to the holders of the asset-backed securities. Securitisation is an important source of non-bank finance and facilitates risk transfer. Securitisation creates contingent assets. Asset-backed securities (ABS) refer to securitisations that are collateralised by loans and receivables. When debt securities are backed by mortgages they are called mortgage-backed securities (MBS), more specifically residential mortgage-backed securities (RMBS) and commercial mortgage-backed securities (CMBS). The issuance of asset-backed commercial paper (ABCP) is a typically short-term security sponsored by banks and collateralised by other financial assets such as trade receivables. ABCP is commonly sold to MMFs; they are an important source of short-term financing for banks.
4.2. Re-securitisation (step 5)

Before the credit crisis in the United States of 2007, securitisation evolved into the creation of complex products. The collateralised debt obligation (CDO) is a structured financial product that pools together cash flow generating assets and repackages this asset pool into different ‘tranches’ that are sold to investors. The idea was to create fixed-income securities from a pool of diversified debt instruments with different yields and risks. The pooled assets (mortgages, loans, bonds) are debt obligations that serve as collateral for the collateralised debt obligation. The CDO is sliced into tranches with different risk profiles: ‘senior’, ‘mezzanine’ and ‘equity’, which catch the cash flow of the loans. Interest and principal payments are first paid to the least risky senior tranches, then the mezzanine tranches, and finally to the equity tranches. Default losses on loans are allocated in reversed order; equity tranches suffer first, then the mezzanine, and only then the senior tranches. Of course, the most risky equity tranches are compensated by the highest yields. Different variations of CDOs are possible, depending on the collateral. Investment-grade (high/medium credit quality) or high-yield (low credit quality, high default risk) corporate and emerging market bonds serve as collateral for a Collateralised Bond Obligation (CBO). A Collateralised Loan Obligation (CLO) is a CDO based on corporate loans. A CDO can even be backed by a pool of other CDOs (CDO-squared). Residential mortgage-backed securities (RMBS), commercial mortgage-backed securities (CMBS) and other asset-backed securities can be recycled into ABS CDOs (re-securitisation). ABS CDOs are structured financial instruments that purchase and pool financial assets such as the riskier tranches of various mortgage-backed securities. High grade ABS CDOs re-securitise the senior tranches of RMBSs and ABSs. Mezzanine ABS CDOs recycle the mezzanine tranches of RMBSs and ABSs. Both ABS CDOs issue super-senior, senior, mezzanine and equity tranches against their portfolio. These CDOs are securitisation structures with multiple layers of credit transformation. Another form of re-securitisation is the synthetic CDO, which is backed by other credit derivatives, mainly credit default swaps (CDSs). A CDS is an insurance that protects the buyer (usually loan creditor) against some reference loan defaulting (by the loan debtor). The buyer of the CDS pays a ‘fee’ or ‘spread’ to the seller in exchange for a compensation if the loan defaults. Synthetic CDOs are not secured by collateral. They are an opportunity to profit from the default chance of reference securities. Synthetic CDOs have been an instrument for primarily hedge funds to speculate on the default of for example the controversial subprime mortgages (high interest loans to borrowers with low credit ratings). With respect to CDOs in general, the purpose of creating different tranches is to transform and redistribute credit risk associated with the collateral.

4.3. ABS intermediation (step 6)

ABS intermediation occurs by broker/dealers, commercial banks and cash rich investors like investment funds, pension funds and insurance companies. Broker/dealers and investment funds are considered as shadow banks.

4.4.1. Investment funds

Investment funds invest in relatively illiquid securities, performing liquidity and maturity transformation. Retail funds may be considered outside the shadow banking sector, because of regulatory restrictions on leverage and eligible assets. And long-only equity funds are not typically shadow banks, since they are holding easy-to-liquidate assets. Leverage is relatively low in most investment funds, in absolute terms and compared to other financial intermediaries.

Trust companies, like real estate investment trusts (REITs), provide a liquid method to invest in real estate. The bulk of trust financing is directed towards infrastructure, industrial and commercial projects, and real estate. Equity REITs invest in real estate properties. Their main revenues are properties’ rents. Mortgage REITs borrow money with the purpose of providing mortgages to real estate owners or purchasing existing mortgages and mortgage-backed securities. The revenue of these dealers in property
mortgages is primarily interest on mortgage loans. With respect to risks associated with liquidity and maturity, there is an important difference between closed-end funds and open-end funds. Closed-end funds allow the investors to redeem their units at predetermined intervals, under specific circumstances, for limited amounts. Open-end funds don’t restrict investors to redeem their capital.

4.4.2. Broker/dealers

A broker/dealer executes orders on behalf of clients (broker) and trades on own account (dealer), giving investment advice, raising capital and supplying liquidity. Broker/dealers are active in the repo market, which involves secured borrowing from cash-rich entities (MMF) to finance trading activities, creating maturity and liquidity transformation. These trading activities refer to securities and derivatives. Credit assets (mortgages, real estate loans) are structured by broker/dealers and sold to securitisation vehicles. Prime brokers and custodian banks are lending agents that intermediate securities loans between counterparties, such as investment funds.

4.4. Funding (step 7)

Funding of shadow banking activities is ultimately provided by Money Market Funds (MMFs) and the repo market.

4.4.1. Money Market Funds

Money Market Funds (MMFs) are collective investment schemes that invest in short-term (held-to-maturity) debt securities, such as government securities and commercial paper. MMF units/shares can be valued at market prices (VNAV) or at cost prices (CNAV). Since CNAV MMFs offer a constant net asset value, they are more vulnerable to runs. If mass redemption requests occur in a disorderly manner, CNAV MMFs cannot meet their obligations to all investors, and only the first redeemers may be able to secure their principal. On the contrary, liquidity risk of VNAV funds is exposed to all investors. MMFs are the main holders of bank-issued commercial paper, so they are an important source of short-term liquidity for the banking sector. MMFs are the interconnection between banking and nonbank financial sectors.

4.4.2. Repo market

A ‘sale and repurchase agreement’, simply ‘repurchase agreement’ or ‘repo’, is the sale of securities coupled with an agreement to repurchase the securities at a later date, at a specific price (a higher repurchase price reflects interest). One party borrows cash from another by pledging financial securities as collateral. ‘Overnight repos’ are one-day transactions that ‘roll over’ automatically until either party chooses to exit. ‘Term repos’ have longer terms, but usually shorter than three months. Repos are classified by the way they are settled. In a ‘bilateral repo’ transaction two counterparties directly transfer cash and securities with each other. This occurs often between broker/dealers (central bank monetary policy operations and government debt management) or if specific collateral is desired. ‘Tri-party repos’ are settled via a third party clearinghouse (large tri-party clearing banks are Bank of New York Mellon and JPMorgan Chase). This predominant form of usually overnight repo transactions is highly standardised against general collateral. Less common ‘Held-in-custody repos’ have high risk because the collateral is pledged but held in custody by the borrower. The purpose of a repurchase agreement is cash financing. In the repurchase agreement a ‘haircut’ can be applied; the value of the collateral is higher than the cash borrowed. The haircut serves as protection against potential value loss of the collateral, reflecting the safety of the collateral but also the creditworthiness of the debtor. Main cash borrowers are banks, broker/dealers, hedge funds and other investment funds. Cash-rich lenders are MMFs, pension funds, insurance companies and municipalities. The repo market plays a role in providing highly liquid financing and supporting the well-functioning of the financial system. Repos offer investors an alternative to bank
deposits to get better interest rates. Further, bank deposits are insured only to a limited amount, while in the repo market deposits are secured by collateral. Repo transactions are collateralised by ‘general collateral’ or ‘specials’. General collateral is characterised to be liquid, high-quality, widely accepted (government securities). Specials are less liquid, less widely accepted (corporate debt). These potentially illiquid financial assets are used as collateral in the U.S. and European repo market. The haircut is expected to be lower for safer collaterals like government securities. The repo market plays an important role in the shadow banking system and its collapse was central to the recent financial crisis. In March 2008, money market funds refused to roll-over overnight repo financing to Bear Stearns, who held AAA-rated mortgage-backed securities. A significant repo run - as a reaction to the perceived creditworthiness of the debtor as opposed to the quality of the collateral - resulted in a liquidity crisis, ultimately leading to the Federal Reserve-assisted sale of Bear Stearns to JPMorgan Chase (Acharya and Öncü 2010).

Securities lending is economically similar to repurchase agreements; both are a collateralised loan. Where repos are cash driven, securities lending is security driven. The motivation of a repurchase agreement is to borrow cash, backed by general securities as collateral. In securities lending the purpose of the cash lender is to borrow specific securities. Securities lending is used to facilitate ‘short-selling’ of equity securities, that is the sale of securities that one does not own. Primarily hedge funds are directly (or via an intermediary) borrowing securities from prime brokers and broker/dealers. They can sell the securities to speculate on a price fall of these securities against other securities. Other reasons for going short are risk management and arbitrage, supporting the efficient functioning of financial markets. A haircut is applied to the transaction. Cash collateral acquired in securities lending may be invested in repurchase agreements (liquidity transformation), forming an interconnection between the security lending market and the repo market. Large insurance companies like AIG reinvested cash collateral from securities lending in long-term and illiquid assets. During the financial crisis borrowers of securities sought to return them (deleveraging). AIG needed to liquidate some illiquid assets to return the cash and faced sizable losses (Adrian et al 2011).

4.5. Safety net

Explicit official enhancement – in the definition of Poszar et al. (2010) – refers to on-balance sheet funding by depository institutions (discount window/standing facilities, deposit insurance), and in many countries also to pension funds and insurance companies via guarantee schemes.

4.5.1. Banks

Regular banks have access to central bank liquidity and deposit insurance. The U.S. public source of liquidity is the Federal Reserve’s ‘discount window’, providing a reliable backup source of funding. This lending program gives access to ‘primary credit’ and ‘secondary credit’ (and seasonal credit). Primary credit is easily provided to financially sound depository institutions on a very short-term basis, typically overnight, at a rate 50 basis points above the Federal Open Market Committee's (FOMC) target rate for federal funds. Secondary credit is available to depository institutions that are not eligible for primary credit. It is also extended on a very short-term basis, typically overnight, but at a rate 50 basis points above the primary credit rate. Additionally, the use of secondary credit meets restrictions (timely rely on market sources, no expansion of borrower’s assets, higher haircuts on collateral). In December of 2007, the Federal Reserve introduced the Term Auction Facility (TAF), which provided credit to depository institutions through an auction, where banks could bid anonymously, avoiding the public perception that a bank is having financial problems. An important alternative to the discount window is the Federal Home Loan Bank (FHLB) System, created during the Great Depression. This government sponsored enterprise (GSE) consists of 12 Federal Home Loan Banks, privately owned by thousands of U.S. financial institutions, which are commercial banks, thrifts (savings and loans business), credit unions, and insurance companies. The FHLBanks’ core mission is to serve as a reliable source of liquidity, provided primarily
through ‘advances’ (secured FHLBank loans) to their member institutions in support of housing finance and community lending.

In the euro area the discount window is called ‘standing facilities’. This Eurosystem instrument aims to provide and absorb overnight liquidity, signal the general monetary policy stance and bind overnight market interest rates. Two standing facilities are available. The ‘marginal lending facility’ is used to obtain overnight liquidity from the national central banks against sufficient underlying assets. The ‘deposit facility’ can be used to stall excess funds within the European Central Bank System (ECBS). Under normal circumstances, there are no limits or other restrictions on banks’ access to these facilities.

Public sources of insurance relate to deposit guarantees. The Federal Deposit Insurance Corporation (FDIC) is an independent agency of the United States government that guarantees the depositor’s accounts (checking accounts, savings accounts, money market deposit accounts, certificates of deposit) in banks and savings associations. The FDIC was established in 1933, and nowadays (since August 2014) it insures $250,000 per depositor, per insured bank, for each account ownership category.

In the European Union deposit guarantees have been increased to prevent bank runs in the beginning of the financial crisis. In October 2008 the European Commission expanded the Directive (94/19/EC) on Deposit Guarantee Schemes to maintain the confidence of depositors in the financial safety net. The minimum level of coverage for deposits has been increased within one year from €20,000 to €100,000.

4.5.2. Pension funds

Pension Benefit Guarantee Schemes are the subject of country studies by the OECD (Stewart 2007). Explicit insolvency insurance for defined benefit pension plans exist in the USA (Pension Benefit Guarantee Corporation (PBGC)), Sweden, Germany (Pensions-Sicherungs-Verein Versicherungsgesellschaft auf Gegenseitigkeit (PSVaG)), Ontario - Canada, Switzerland, Japan and in the UK (Pension Protection Fund (PPF)).

Some countries - like the Netherlands – focus on pension benefit protection via strong funding rules, ensuring that pensions are never underfunded. If a pension fund cannot meet the 105% funding requirement (reserve of 5%), it must inform the Dutch Central Bank, and a plan of action must be developed to raise the funding ratio. In practice the Dutch underfunded pension funds are allowed to raise pension premiums or cut pension benefits; defined benefit is not so defined as it may sound. Rising bankruptcy levels of corporate plan sponsors and underfunding of pension funds underlines the need for both Pension Benefit Guarantee Schemes and adequate funding rules.

4.5.3. Insurance companies

Insurance Guarantee Schemes (IGS) offer protection to policyholders and beneficiaries by paying claims or securing the continuation of insurance contracts, when insurers fail. American life and health insurance guaranty associations of all 50 states and the District of Columbia are working together through the National Organization of Life and Health Insurance Guaranty Associations (NOLHGA). They form a national safety net, protecting insurance consumers. A comparative study on Insurance Guarantee Schemes in the EU, commissioned by the European Commission (Oxera 2007), shows that 13 of the 27 EU Member States provide an IGS. However, there are some differences between countries. In eight countries (Latvia, Malta, Romania, Spain, UK, Poland, France, Germany) the IGS covers both life insurance and non-life insurance. Other countries (Denmark, Ireland) have a single scheme that covers non-life insurance. In Belgium, Finland and Italy the schemes only apply to specific classes of non-life insurance.

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2 In Poland non-life insurance applies only to a few specific classes of compulsory insurance.
In the Netherlands there is no IGS, although special arrangements concerning life insurance and health insurance do exist. The Early Intervention Arrangement for Life Insurers (Opvangregeling Leven) protects consumers. This arrangement prevents insolvency of life insurance by facilitating portfolio transfer and securing contract continuity. If the portfolio of the life insurer is still viable (assets cover technical provisions) the Dutch Central Bank can force reinsurance agreements and a portfolio transfer, executed by the Dutch Insurance Association (Verbond van Verzekeraars). If a health insurer fails to meet contract commitments, the policyholders are compensated for unsettled claims by the Health Care Insurance Board (Zorginstituut Nederland), which is a government agency.

5. The Netherlands

The second part of this paper adopts the challenge to quantify the size and risk of the Dutch shadow banking sector. Firstly, a definition is chosen that is applicable to the Netherlands. The sources, quality of the data and their applicability to the Netherlands will be paid attention to. After the results are presented, the analysis will focus on the risks of leverage and interconnectedness.

5.1. Definition

The Financial Stability Board (FSB) has estimated the size of shadow banking based on flow of funds data for Australia, Canada, Japan, Korea, United Kingdom, United States of America and the euro area. Global shadow banking showed a rapid growth before the crisis from $27 trillion in 2002 to $60 trillion in 2007. The shadow banking system declined in 2008 to $56 trillion, but recovered to $60 trillion in 2010 (FSB 2011b). Non-bank intermediaries represent 25-30 percent of the total financial system, which corresponds to about half the size of assets in the regular banking sector. The 2010 assets share of other financial institutions (all sectors except central bank, monetary banks, insurance companies, pension funds) in the countries mentioned above and five euro area countries (France, Germany, Italy, Netherlands, Spain), shows that shadow banking is largest in the United States (46%). The shadow banking sector is also predominant in the United Kingdom (13%), Japan (8%) and the Netherlands (8%). Since the Netherlands is one of the countries where shadow banking is predominant, it is interesting to measure the size and risk of the Dutch shadow banking system. The estimation of the Financial Stability Board simply sums up the total assets of all OFIs; MMFs, non-MMF investment funds, Other Financial Intermediaries (OFIs), financial auxiliaries, and captive financial institutions and money lenders. The latter subsector includes Special Purpose Entities (SPEs). Following this approach, shadow banking in the Netherlands is 5.3 trillion euros in 2013. For comparison, total assets of regular banks are 2.2 trillion euros.

Most definitions described in paragraph 2 limit shadow banking to credit intermediation. All OFIs are taken into account, but only credit intermediation assets (deposits, securities, loans, derivatives) are seen as shadow banking activities. This way, Dutch shadow banking would be 2.2 trillion euros in 2013. The size of credit intermediation by traditional banks is 2.1 trillion euros.

Financial auxiliaries are considered as shadow banks. Although they are not financial intermediaries themselves, their activities are closely related to financial intermediation. The FSB (2011a) considers activities that constitute the credit intermediation chain also as the core business of shadow banks. The European System of Accounts (ESA) 2010 (European Union 2013) defines financial auxiliaries:

2.95 “Definition: the financial auxiliaries subsector (S.126) consists of all financial corporations and quasi-corporations which are principally engaged in activities closely related to financial intermediation but which are not financial intermediaries themselves.”

The definitions underline that shadow banking occurs without a safety net. Shadow banks need a backstop to absorb systemic risks, because they do not have access to central bank liquidity or public...
Many countries have Pension Benefit Guarantee Schemes and Insurance Guarantee Schemes. In the Netherlands pension funds and insurance companies are not protected by explicit guarantee schemes. However, Dutch pension funds face strong funding rules, by which the Dutch Central Bank ensures that they have enough reserves and are not underfunded. Dutch insurance companies have special arrangements by which the Dutch Central Bank and governments agencies protect the consumers and policyholders against insolvency and bankruptcy. Because of this implicit access to public guarantees, pension funds and insurance companies are not considered as shadow banks.

The size of the Dutch financial sector is biased by SPEs. Figure 1 shows the share in credit intermediation by all OFI sectors.

**Figure 1. Credit intermediation by OFI sector, 2013**

SPEs have a large amount of loans on their balance sheet (loans assets 1.1 trillion euros and loans liabilities 0.8 trillion euros in 2013). However, most of these loans (95 percent of loans assets and 84 percent of loans liabilities) are intra-concern loans, typically with the rest of the world. It is questionable if SPEs are financial intermediaries. ESA 2010 (European Union 2013) gives a definition of financial intermediation and delineates the captive financial institutions and money lenders subsector, which in the Netherlands particularly consists of SPEs:

“2.56 Financial intermediation is the activity in which an institutional unit acquires financial assets and incurs liabilities on its own account by engaging in financial transactions on the market. The assets and liabilities of financial intermediaries are transformed or repackaged in relation to, for example, maturity, scale, risk, etc. in the financial intermediation process.”
“2.98 Definition: the captive financial institutions and money lenders subsector (S.127) consists of all financial corporations and quasi-corporations which are neither engaged in financial intermediation nor in providing financial auxiliary services, and where most of either their assets or their liabilities are not transacted on open markets.”

“2.99 SPE that qualify as institutional units that raise funds in open markets to be used by their parent corporation.”

An important criteria for financial intermediation is being engaged in financial transactions on own account in assets and liabilities on open markets. SPEs are not financial intermediaries because either their assets or their liabilities are not transacted on open markets. ESA gives no definition of credit intermediation, but since financial intermediation is based on the open market criteria, this should also be the case for credit intermediation. Thus SPEs are not part of shadow banking according to ESA. Credit intermediation by shadow banks excluding SPEs is 1.0 trillion euros in 2013.

5.2. Data

Shadow banking sources are the Dutch National Accounts, more specifically the Sector Accounts. They contain the balance sheets and financial transactions of all sectors in the economy. The OFI sector is divided into five different subsectors: MMFs, non-MMF investment funds, OFIs (including SPVs and SPE-SPVs), financial auxiliaries, captive financial institutions and money lenders (including SPEs). Many financial institutions report to the Dutch Central Bank. MMFs and non-MMF investment funds report via the Direct Report (DRA). Data on SPVs are based on public sources like annual reports. Since 2009Q4 statistics on SPVs are reported by Monetary Financial Institutions (MFIs) as originators. Data on SPE-SPVs are derived from reports for the compilation of the balance of payments, available since 2009Q4. Balance sheets of non-MFI daughters of MFIs are reported by the MFIs. Each bank reports only the aggregated balance sheet of all its daughter companies that themselves are not an MFI, of which financial lease. The DRA source also has information on treasury centres, who particularly leverage themselves with derivatives and are primarily hedging risks for pension funds. Data of head offices and other OFIs are derived from annual reports.

Data gaps arise for the repo and securities lending markets. Adrian et al. (2011) argue that, for a better understanding of firm-level and systemic risk in the repo and securities lending market, the minimum requirements are micro data on: principal amount, interest rate, collateral type, haircut, tenor (maturity), and counterparty. Statistics Netherlands has no such data on the Dutch repo and securities lending markets. The lack of micro data on repos make it almost impossible to address the liquidity risks in the shadow banking system.

Finance companies and broker/dealers are non-bank financial entities that are engaged in loan origination. Some of the non-MFI daughters of MFIs can be classified as a finance company or a broker/dealer, but banks are reporting only the total of their non-MFI daughters. So, an assumption is made to complete the picture of shadow credit intermediation. All lending by OFIs other than SPVs is considered to be non-bank loan origination. Mortgages and consumer credit are assumed to be originated by finance companies, other loans are assumed to be provided by broker/dealers.
5.3. Results

Table 1 presents the total assets, credit intermediation and leverage of Dutch shadow banks.

Table 1. Size and leverage of Dutch shadow banks, 2013

<table>
<thead>
<tr>
<th>Financial sector</th>
<th>Total assets</th>
<th>Credit intermediation</th>
<th>Leverage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Money Market Funds (MMF)</strong></td>
<td>3,297</td>
<td>3,297</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Non-MMF investment funds</strong></td>
<td>639,696</td>
<td>263,963</td>
<td>1.1</td>
</tr>
<tr>
<td>of which</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real estate funds</td>
<td>88,435</td>
<td>11,481</td>
<td>1.2</td>
</tr>
<tr>
<td>Hedge funds</td>
<td>21,677</td>
<td>1,520</td>
<td>1.0</td>
</tr>
<tr>
<td>Equity funds</td>
<td>229,188</td>
<td>3,206</td>
<td>1.0</td>
</tr>
<tr>
<td>Bond funds</td>
<td>241,155</td>
<td>216,444</td>
<td>1.1</td>
</tr>
<tr>
<td>Mixed funds</td>
<td>12,696</td>
<td>834</td>
<td>1.0</td>
</tr>
<tr>
<td>other funds</td>
<td>46,545</td>
<td>30,478</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Other financial intermediaries (OFI)</strong></td>
<td>795,695</td>
<td>697,654</td>
<td>9.8</td>
</tr>
<tr>
<td>of which</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPVs and SPE-SPVs</td>
<td>363,255</td>
<td>355,712</td>
<td>464,520.6</td>
</tr>
<tr>
<td>SPVs</td>
<td>281,563</td>
<td>276,687</td>
<td>-2,037.1</td>
</tr>
<tr>
<td>SPE-SPVs</td>
<td>81,692</td>
<td>79,025</td>
<td>587.7</td>
</tr>
<tr>
<td>Other OFIs</td>
<td>432,440</td>
<td>341,942</td>
<td>5.3</td>
</tr>
<tr>
<td>of which</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-MFI daughters of MFIs</td>
<td>120,979</td>
<td>103,787</td>
<td>11.8</td>
</tr>
<tr>
<td>Financial lease</td>
<td>19,007</td>
<td>17,406</td>
<td>22.8</td>
</tr>
<tr>
<td>Treasury centres</td>
<td>138,053</td>
<td>123,432</td>
<td>101.6</td>
</tr>
<tr>
<td>Other OFI</td>
<td>154,401</td>
<td>97,317</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Financial auxiliaries</strong></td>
<td>175,116</td>
<td>37,843</td>
<td>1.4</td>
</tr>
<tr>
<td>of which</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headoffices</td>
<td>165,554</td>
<td>34,342</td>
<td>1.4</td>
</tr>
<tr>
<td>Non-MFI daughters of MFIs</td>
<td>1,055</td>
<td>745</td>
<td>1.4</td>
</tr>
<tr>
<td>Other OFI</td>
<td>8,507</td>
<td>2,756</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,613,804</td>
<td>1,002,757</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Sources: Statistics Netherlands, Dutch Central Bank
In the Netherlands, MMFs are very small. At the end of 2013 the balance sheet was only 3.3 billion euros. Not all assets are used for credit intermediation, as can be seen for real estate funds and shares funds. Non-MMF investment funds have 639.7 billion euros of assets on their balance sheet. However, a large part of these assets consist of real estate (29.7 billion) and shares (330.1 billion). Investment funds’ credit intermediation is 261.3 billion euros, of which 215.3 billion euros by securities funds. Almost all of their credit intermediation assets are securities; 204.6 billion euros. Shadow banking particularly occurs in the OFI sector. Most of their assets consist of deposits, securities and loans. SPVs typically have large amounts of securitised assets on their balance sheet. SPVs with a Dutch originator securitised mortgages (193.1 billion euros), other loans (11.1 euros) and other assets (1.1 billion euros). Securitised mortgages not derecognised (that stay on the balance sheet of banks) are 63.4 billion euros. SPE-SPVs (which are SPVs with a foreign originator) securitised 43.1 billion euros of loans, of which 33.8 billion euros of company credits. Other OFIs are also important intermediaries in the shadow credit.

5.4. Leverage of Dutch shadow banks

The introduction of shadow banking (McCully 2007) referred to “levered up non-bank investment conduits, vehicles, and structures”. Leverage is measured as the ratio between total assets and equity. When leverage is the criteria, particularly the OFI sector contains shadow banks. SPVs have an almost infinite leverage, since they have almost no equity. SPE-SPVs have almost no equity, while SPVs with a Dutch originator even show negative equity in 2013. Other OFIs with high leverage are daughter companies of monetary financial institutions (MFI) that themselves are not MFIs (11.8). The non-MFI daughters of MFIs include finance companies and broker/dealers. Financial lease (22.8) and treasury centres (101.6) also show high leverage. Treasury centres primarily leverage themselves with derivatives (69 billion euros in 2013).

5.5. Interconnectedness in the Sector Accounts

The National Accounts are an integrated system. Therefore, corrections are made after the comparison of different sources. The Sector Accounts provide a consistent who-to-whom matrix of different types of transactions. Consolidation of inter-institution links is logical to avoid double counting. Net values are needed to measure the size of shadow banking. However, gross values are useful to evaluate the potential risk of each link in the chain of non-bank credit intermediation (Turner 2012). Table 2 shows a part of the who-to-whom matrix of securities.
Table 2. Who-to-whom matrix of securities, closing balance sheet 2013 (million euros)

<table>
<thead>
<tr>
<th>Subsector</th>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Securities</td>
<td>Non-financial corporations</td>
</tr>
<tr>
<td>Banks</td>
<td>1,115</td>
<td>171,803</td>
</tr>
<tr>
<td>Investment funds</td>
<td>1,181</td>
<td>4,254</td>
</tr>
<tr>
<td>OFIs</td>
<td>462</td>
<td>7,090</td>
</tr>
<tr>
<td>Insurance companies and pension funds</td>
<td>2,931</td>
<td>13,105</td>
</tr>
<tr>
<td>Other subsectors</td>
<td>1,933</td>
<td>1,526</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>89,299</td>
<td>132,961</td>
</tr>
<tr>
<td>Total</td>
<td>97,196</td>
<td>330,739</td>
</tr>
</tbody>
</table>

Source: Statistics Netherlands

The who-to-whom matrix shows the interconnectedness between counterparties; the one party’s assets is the other party’s liabilities. Securities issued by the OFI sector amount to a total of 330.7 billion euros in 2013. In the years before 2012 OFIs had even more securities outstanding than government bonds issued. The most important issuers are SPE-SPVs, which typically have a relation with the rest of the world, and SPVs with a Dutch originator. Banks are buying the majority of securities issued by SPVs. Although the credit risks have been transferred to the balance sheet of SPVs, the banks keep connected to these risk bearing SPVs. Other investors in asset-backed securities are cash rich parties like investment funds, insurance companies and pension funds. Insurance companies and pension funds have more domestic investments in safe government bonds than riskier asset-backed securities. OFIs prefer investment in asset-backed securities over government bonds. Households (other subsectors) also possess securities issued by SPVs. They are on the balance of custodian banks. Finally, corporate bonds issued by non-financial institutions are primarily bought by the rest of the world. In the scheme of Poszar (2008) corporate bonds are securitised into CDOs. In the Netherlands, these amounts are very small. OFIs also have very few municipal bonds on their balance sheet. For simplicity, securities issued by the rest of the world are left out of the picture, because it is unclear which type of entities it concerns. However, it is clear that the Dutch financial system is connected to shadow banking in the rest of the world too.

6. Conclusion

What is shadow banking? The definition of shadow banking has been an evolving concept in the literature. Most definitions refer to credit intermediation outside the regular banking system, without access to central bank liquidity or public sector credit guarantees. The most important component of shadow banking is securitised debt, which is debt secured by collateral assets. Typical securities financing transactions are securitisation, securities lending and repos. The raison d’être of shadow banking lies in the
benefits, although the recent financial crisis has particularly reminded us of the risks. Benefits are alternative investments, alternative credit, risk diversification and efficient financial markets. Risks are involved in credit transfers, maturity and liquidity transformation, leverage, and interconnectedness, which makes the shadow banking sector a systemic risk. The map of Poszar (2008) provides a comprehensive picture of the shadow banking system. Whereas a traditional bank intermediates between savers and borrowers under one roof, shadow banking is a chain of credit intermediation. This chain involves multiple steps, from loan origination, via warehousing, (re-)securitisation and intermediation, to funding (Poszar 2010). The case study of the Netherlands show that data collection on shadow banking activities can be strengthened to enable investors and regulators the monitoring of credit flows and risks. A valuable source of data is the Dutch National Accounts, more specifically the Sector Accounts. They contain the balance sheets of financial institutions. It is clear that shadow banking is more than a list of entities and activities. Therefore, besides measuring the size of shadow banks by looking at balance sheets, the analysis has also focussed on the risks of leverage and especially interconnectedness. The example of the who-to-whom matrix of securities shows that the Sector Accounts can give insight to the interconnectedness of different sectors in the economy.
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